

Claims:

1. A water soluble tin mesoporphyrin compound comprising tin mesoporphyrin complexed with a second agent.

2. The water soluble tin mesoporphyrin compound of claim 1, wherein the second agent includes an amino acid.

3. The water soluble tin mesoporphyrin compound of claim 2, wherein the compound is in liquid or solid form.

4. The water soluble tin mesoporphyrin compound of claim 2, wherein the amino acid is selected from the group consisting of arginine, glycine, alanine, leucine, serine, lysine, histidine, phenylalanine, tyrosine and combinations thereof.

5. A pharmaceutical formulation comprising a water soluble tin mesoporphyrin compound and at least one pharmaceutically acceptable carrier.

6. The pharmaceutical formulation of claim 5, wherein the water soluble tin mesoporphyrin compound comprises tin mesoporphyrin complexed with a second agent.

7. The pharmaceutical formulation of claim 6, wherein the second agent includes an amino acid.

8. The pharmaceutical formulation of claim 7, wherein the water soluble compound is in liquid or solid form.

9. The pharmaceutical formulation of claim 7, wherein the amino acid is selected from the group consisting of

arginine, glycine, alanine, leucine, serine, lysine, histidine, phenylalanine, tyrosine and combinations thereof.

10. The pharmaceutical formulation of claim 7, wherein the formulation contains between about 0.1 and about 50 mg of tin mesoporphyrin.

11. A method of preparing a water soluble complex of tin mesoporphyrin comprising mixing a tin mesoporphyrin compound in solution with an amino acid.

12. The method of claim 11, wherein the solution is a basic solution.

13. The method of claim 12, wherein the solution comprises an aqueous solution of sodium hydroxide.

14. The method of claim 2, wherein the amino acid is selected from the group consisting of arginine, glycine, alanine, leucine, serine, lysine, histidine, phenylalanine, tyrosine and combinations thereof.

15. The method of claim 11, wherein the ratio of the tin mesoporphyrin compound to amino acid is at least about 2:1.

16. The method of claim 14, wherein the ratio of the tin mesoporphyrin to basic solution is at least about 1:3.

17. The method of claim 11, further comprising filtering the solution to obtain a solid or a pharmaceutical acceptable liquid.

18. The method of claim 17, wherein when the filtered product is a solid, further comprising vacuum drying the solid.

19. The method of claim 11, wherein the tin mesoporphyrin compound includes a mesoporphyrin halide.

20. The method of claim 19, wherein the halide includes tin mesoporphyrin dichloride.

21. The method of claim 11, further comprising subjecting a tin mesoporphyrin intermediate to a catalytic hydrogenation, recovering a formate salt of tin mesoporphyrin, drying the formate salt to obtain a tin mesoporphyrin formate, subjecting the mesoporphyrin IX formate to a chemical metal insertion process reaction with a metal halide compound under buffered, reaction conditions to produce a metal mesoporphyrin halide.

22. A pharmaceutical formulation including a tin mesoporphyrin compound formed by the method of claim 11 mixed with at least one pharmaceutically acceptable carrier.

23. A method of preparing a water-soluble complex of metal mesoporphyrin, which comprises:

subjecting a reaction mixture of hemin and a hydrogenation catalyst for a first elevated temperature and a first period of time;

subjecting the reaction mixture to a second elevated temperature for a second period of time;

recovering a formate salt from the reaction mixture and drying the salt to obtain a metal mesoporphyrin IX formate;

subjecting the mesoporphyrin IX formate to a chemical metal insertion process reaction with a metal halide compound under reaction conditions to produce a metal mesoporphyrin halide; and reacting the metal mesoporphyrin halide with at least one amino acid in the presence of a basic solution to produce a water-soluble complex of metal mesoporphyrin.

24. The method of claim 23, wherein the first temperature is higher than the second temperature.

25. The method of claim 24, wherein the first temperature is between about 85-95°C.

26. The method of claim 25, wherein the reaction mixture of hemin and hydrogenation catalyst is in an acid and subjected to hydrogen pressure for at least one hour.

27. The method of claim 26, wherein the second temperature is between about 45-50°C and the second period of time is at least about 3 hours.

28. The method of claim 27, wherein subjecting the mesoporphyrin IX formate to a chemical metal insertion process reaction with a metal halide compound is in the presence of an oxidant under buffered, acidic reaction conditions.

29. A pharmaceutical composition including a metal mesoporphyrin compound made by the process of claim 23.

30. The pharmaceutical composition of claim 29, wherein the metal mesoporphyrin includes tin mesoporphyrin.

31. The method of claim 30, wherein the amino acid is selected from the group consisting of arginine, glycine, alanine, leucine, serine, lysine, histidine, phenylalanine, tyrosine and combinations thereof.

32. A method of treating a human being with a medical condition comprising administering a pharmaceutically effective amount of a water soluble tin mesoporphyrin compound.

33. The method of claim 32, wherein the water soluble tin mesoporphyrin compound comprises tin mesoporphyrin complexed with a second agent.

34. The method of claim 33, wherein the second agent includes an amino acid.

35. The method of claim 34, wherein the amino acid is selected from the group consisting of arginine, glycine, alanine, leucine, serine, lysine, histidine, phenylalanine, tyrosine and combinations thereof.

36. The method of claim 35, wherein the condition is hyperbilirubinemia.

37. The method of claim 35, wherein the condition is psoriasis.